

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Applicants respectfully request that the foregoing amendments be entered at least because they raise no new issues requiring further search or consideration, and because they narrow the issues for appeal.

Claims 1, 2 and 14 are being cancelled without prejudice or disclaimer. Claims 3-4, 6-10, 12 and 13 are being amended. Claim 10 has been amended to be in independent form.

This amendment changes and deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 3-13 and 15-16 are now pending in this application.

Rejection under 35 U.S.C. § 112, second paragraph.

Claims 1-12 stand rejected under 35 U.S.C. § 112, second paragraph. In the rejection, the Examiner stated on page 2:

The scope of the recitation "a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst" is indefinite in that, any condensation process would heat the exhaust gas stream, this is an inherent function of the condensation process. At what point in a system would applicant consider the condensation of the water to contribute to a rise in temperature?

Applicants respectfully traverse the rejection for the following reasons.

As an initial matter, applicants traverse the Examiner's assertion that any condensation would heat the exhaust gas stream, and as such would be an inherent function of the condensation process, to the extent that the Examiner is suggesting that a rise in temperature of the CO oxidation catalyst is inherent. Even if the condensation heat per se is

inherent, a rise in temperature of the CO oxidation catalyst cannot be achieved without combination with the limitation as recited of "*a H₂O trap disposed upstream of and close to the CO oxidation catalyst*". In this limitation, the recitation of "*absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst*" provides a degree of closeness between the H₂O trap and the CO oxidation catalyst which is not merely inherent.

Moreover, the test for definiteness under 35 U.S.C. 112, second paragraph, is not whether a claimed limitation is provided with precise definition, *See Seattle Box Co., v. Industrial Crating & Packing, Inc.* 731 F.2d 818 221 USPQ 568 (Fed. Cir. 1984), but instead whether one skilled in the art would understand what is claimed when the claim is read in light of the specification. *See Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ 2d 1081, 1088 (Fed. Cir. 1986). In the present case, the aforementioned claim limitation in the claims is sufficiently clear and precise. The range where absorption and condensation heat is capable of contributing to a rise in temperature is limited because the exhaust gas after flowing out of the water trap is rapidly cooled by heat conduction to ambient air and by heat radiation. Thus, one skilled in the art would understand the limitation "*a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst*" to mean that the water trap and the CO oxidation catalyst must stand sufficiently close to each other to fall in the range where absorption and condensation heat is capable of contributing to a rise in temperature.

Moreover, one skilled in the art could readily determine whether a water trap disposed upstream of a CO oxidation catalyst was so dimensioned that absorption heat and condensation heat of water contributed to a rise in temperature of the CO oxidation catalyst. For example, it would be expected that one skilled in the art would be familiar with heat transfer, and could calculate heat transfer and estimate the range where there is a contribution to a rise in temperature of the CO oxidation catalyst based on data such as flow rate, composition and temperature of the exhaust gas, condensation rate of water in the water trap, and dimensions of the water trap and the CO oxidation catalyst and physical properties of

material related to these elements. Therefore one skilled in the art would be sufficiently apprised of the scope of the claims.

Furthermore, a claimed limitation need not have definite and fixed numerical ranges, such as being expressed in millimeters or microns, as long as a person skilled in the art would be reasonably apprised of the scope of the claim. In the present case, a person skilled in the art would be expected to be knowledgeable in the theory of heat transfer because an exhaust emission control system is subject to exhaust gas of high temperature and heat is a concern. Such a person skilled in the art would be expected to accomplish a heat transfer calculation based on given data including dimensional data of the system at issue, and flow rate, composition and temperature of the exhaust gas, to determine whether the system at issue would fall within the scope of the claim. The specific closeness of the trap and CO oxidation catalyst would vary depending on design requirements such as vehicle size and engine size. In such a situation, use of the proper functional phrase "so dimensioned" provides sufficiently clarity to the claim to allow one skilled in the art to be reasonably apprised of its scope. (See MPEP 2173.05(b), in *Orthokinetics, Inc. v, Safety Travel Chairs, Inc.*, 806 F. 2d 1565, 1 USPQ2d 1081 (Fed. Cir.1986) , the court stated that the phrase "so dimensioned" is as accurate as the subject matter permits.) There is no requirement that the claimed limitation be limited to a particular distance in microns or milimeters between the trap and CO oxidation catalyst to be definite.

In sum, the recitation in the claims of "a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst" is clear and definite. Accordingly, applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph be withdrawn.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,776,417 to Frost et al. (hereafter "Frost"). Claims 10-12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Frost in view of U.S. Patent No. 6,029,441

to Mizuno et al. (hereafter "Mizuno"). The rejection of claims 1-9 under 35 U.S.C. § 102(b) is moot in light of the cancellation of independent claims 1 and 2, and the amendment to the claims such that dependent claims 3-9 depend directly or indirectly from claim 10, now in independent form. Applicants respectfully traverse the rejection under 35 U.S.C. 103(a) for the reason that a prima facie case of obviousness has not been established.

To establish a prima facie case of obviousness, three basic criteria must be met. More specifically, 1) there must be suggestion or motivation to combine reference teachings, 2) there must be a reasonable expectation of success, and 3) the references in combination must teach or suggest all the claim limitations. (see M.P.E.P. section 2143). At least the first and third criteria are not met as discussed below.

Regarding the first criteria, one skilled in the art would have been led away from combining the teachings of Frost and Mizuno, in that modifying Frost as suggested in the Office Action would have rendered the Frost device unfit for its intended purpose. In particular, Frost discloses in the first paragraph in col. 1 that his invention concerns improvements in emission control, and further teaches in the "SUMMARY" in col. 1, lines 49-55 that predrying the HC trap and the catalyst system leads to substantial improvements in the overall performance of the system. Thus in the Frost system, a water trap must be disposed upstream of the HC trap in view of the intended purpose to accomplish predrying in the system. Modifying the Frost system to dispose the HC trap upstream of the water trap with a secondary air supply intervening therebetween would render the Frost system unfit for its intended purpose, which includes predrying the HC trap. Thus modifying Frost as suggested in the Office Action would have rendered the Frost device unfit for its intended purpose, and thus there is no proper motivation to make the proposed modification.

Regarding the third criteria, at least the limitation of *"a H₂O trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst"* commonly recited in amended claims 10-12 is neither taught nor suggested in the applied art. Frost is silent regarding an arrangement of a CO oxidation catalyst and a H₂O trap such that

that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst.

The Office Action states on page 3 “With regard to the water trap contributing to a rise in temperature of the CO oxidation catalyst, this is an inherent function of the condensation process.” Applicants respectfully disagree, for reasons discussed in the Amendment filed on September 26, 2005. As discussed above, the range where absorption and condensation heat is capable of contributing to a rise in temperature is limited because the exhaust gas after flowing out of the water trap is rapidly cooled by heat conduction to ambient air and by heat radiation. Thus, it is not the case that the heat from the water trap inherently contributes to a rise in temperature of the CO oxidation catalyst. Applicants note that the rejection under 35 U.S.C. § 112, second paragraph, where the Office Action finds that the language in the claims is indefinite, is not a substitute for a proper rejection under 35 U.S.C. § 102/103. The language in claim 1 is definite, and is not disclosed by Frost.

Mizuno was cited for allegedly disclosing an HC trap upstream of a secondary air supply unit, and but does not cure the deficiencies of Frost.

The dependent claims are patentable for reasons analogous to their respective dependent claims, as well as for further patentable features recited therein. For example, claim 13 recites “wherein the H₂O trap is disposed upstream of and close to the CO oxidation catalyst and so dimensioned that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst to attain an early activation of the CO oxidation catalyst.” Frost fails to realize the benefits of the arrangement of a CO oxidation catalyst and a H₂O trap as recited in claim 13, where the adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst to attain an early activation of the CO oxidation catalyst. The arrangement of the H₂O trap and the CO oxidation catalyst as recited in claim 13 provides a relatively immediate rise in temperature of the CO oxidation catalyst just after an engine start, which leads to a quick light-off of the CO oxidation catalyst. Frost, failing to suggest the arrangement of a CO oxidation catalyst and a H₂O trap as recited in claim 13, also fails to realize the benefits resulting therefrom. Analogous arguments apply to dependent claims 15-16.

Applicants further note that the Office Action does not address dependent claims 13 and 15-16 in the rejections under 35 U.S.C. §§ 102 and 103, and thus these dependent claims are presumably patentable over Frost and Mizuno.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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